Claims:

1. A method for processing N Radio Frequency (RF) bursts contained within N slots of a digital communications time divided frame, wherein N is a positive integer greater than one, the method comprising:

for a first RF burst of the N RF bursts:

pre-equalization processing a first baseband signal to produce a first processed baseband signal; and

equalizing the first processed baseband signal to produce a first plurality of soft decisions after the pre-equalization processing of the first baseband signal is completed;

for each of a second through N^{th} RF burst:

pre-equalization processing a current baseband signal to produce a current processed baseband signal while equalizing a prior processed baseband signal to produce a prior plurality of soft decisions; and

equalizing the current processed baseband signal to produce a current plurality of soft decisions while post-equalization processing the prior plurality of soft decisions; and

post-equalization processing the N^{th} plurality of soft decisions.

2. The method of claim 1, wherein the baseband signal is a digitized signal comprising a plurality of samples.

3. The method of claim 1, further comprising:

determining a modulation format of the baseband signal; and

equalizing the processed baseband signal based upon the determined modulation.

4. The method of claim 3, wherein the determined modulation is selected from at least Gaussian Minimum Shift Keying (GMSK) modulation and Eight Phase Shift Keying (8PSK) modulation.

5. The method of claim 4, wherein:

equalizing a GMSK modulated processed baseband signal employs Maximum Likelihood Sequence Estimation (MLSE) equalization; and

equalizing an 8PSK modulated processed baseband signal employs Maximum A posteriori Probability (MAP) equalization.

6. The method of claim 1, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

soft decision scaling factor processing; and

matched filter processing.

7. The method of claim 1, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

equalizer coefficient calculation;

pre-equalization processing; and

soft decision scaling factor processing.

8. The method of claim 1, wherein post-equalization processing includes at least one operation of the following operations:

phase averaging of a plurality of soft decisions; and

frequency estimation and tracking.

9. A method for processing N Radio Frequency (RF) bursts contained within N slots of a digital communications time divided frame, wherein N is a positive integer greater than one, the method comprising:

for each of the N RF bursts, receiving a corresponding baseband signal;

for at least one of the N RF bursts, pre-equalization processing a corresponding baseband signal to produce a processed baseband signal without concurrently equalizing any processed baseband signal;

for at least one of the N RF bursts, pre-equalization processing a corresponding baseband signal to produce a processed baseband signal while concurrently equalizing a processed baseband signal corresponding to a prior RF burst to produce soft decisions; and

for at least one of the N RF bursts, post-equalization processing soft decisions corresponding to a prior RF burst while concurrently equalizing a processed baseband signal corresponding to the RF burst.

10. The method of claim 9, wherein the baseband signal is a digitized signal comprising a plurality of samples.

11. The method of claim 9, further comprising:

determining a modulation format of each corresponding baseband signal; and

equalizing a corresponding processed baseband signal based upon the determined modulation.

12. The method of claim 11, wherein the determined modulation is selected from at least Gaussian Minimum Shift Keying (GMSK) modulation and Eight Phase Shift Keying

(8PSK) modulation.

13. The method of claim 12, wherein:

equalizing a GMSK modulated processed baseband signal employs Maximum Likelihood Sequence Estimation (MLSE) equalization; and

equalizing an 8PSK modulated processed baseband signal employs Maximum A posteriori Probability (MAP) equalization.

14. The method of claim 9, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

soft decision scaling factor processing; and

matched filter processing.

15. The method of claim 9, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

equalizer coefficient calculation;

pre-equalization processing; and

soft decision scaling factor processing.

16. The method of claim 9, wherein post-equalization processing includes at least one operation of the following operations:

phase averaging of a plurality of soft decisions; and

frequency estimation and tracking.

17. A wireless communication device for processing N Radio Frequency (RF) bursts contained within N slots of a digital communications time divided frame, wherein N is a positive integer greater than one, the wireless communication device comprising:

a RF front end that is operable to receive the plurality of received RF bursts and to convert the RF bursts to corresponding baseband signals;

a baseband processor operably coupled to the RF front end that is operable to receive the baseband signals and to pre-equalization process the baseband signals to produce processed baseband signals and to post-equalization process soft decisions;

an equalizer module operably coupled to the baseband processor that is operable to equalize the processed baseband signals to produce the soft decisions; and

wherein the baseband processor and the equalizer module are operable as a pipeline such that:

for at least one of the N RF bursts, the baseband processor performs pre-equalization processing of a corresponding baseband signal to produce a processed baseband signal while the equalizer module concurrently equalizes a processed baseband signal corresponding to a prior RF burst to produce soft decisions; and

for at least one of the N RF bursts, the baseband processor performs post-equalization processing of soft decisions corresponding to a prior RF burst while concurrently equalizing a processed baseband signal corresponding to the RF burst.

18. The wireless communication device of claim 17, wherein the baseband signal is a digitized signal comprising a plurality of samples.

19. The wireless communication device of claim 17, wherein:

the baseband processor is further operable to determine a modulation format of each corresponding baseband signal; and

the equalizer module is further operable to equalize the processed baseband signal based upon the determined modulation.

20. The wireless communication device of claim 19, wherein the determined modulation is selected from at least Gaussian Minimum Shift Keying (GMSK) modulation and Eight Phase Shift Keying (8PSK) modulation.

21. The wireless communication device of claim 20, wherein:

the equalizer module is further operable to equalize a GMSK modulated processed baseband signal using Maximum Likelihood Sequence Estimation (MLSE) equalization; and

the equalizer module is further operable to equalize an 8PSK modulated processed baseband signal using Maximum A posteriori Probability (MAP) equalization.

22. The wireless communication device of claim 17, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

soft decision scaling factor processing; and

matched filter processing.

23. The wireless communication device of claim 17, wherein pre-equalization processing includes at least two operations of the following operations:

de-rotation and frequency correction;

burst power estimation;

timing, channel, noise, and Signal-to-Noise Ratio estimation;

Automatic Gain Control loop processing;

equalizer coefficient calculation;

pre-equalization processing; and

soft decision scaling factor processing.

24. The wireless communication device of claim 17, wherein post-equalization processing includes at least one operation of the following operations:

phase averaging of a plurality of soft decisions; and

frequency estimation and tracking.